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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,659	03/24/2004	Doo-Hoon Goo	8836-229 (IE12193US)	4316
22150 7590 12/29/2006 F. CHAU & ASSOCIATES, LLC 130 WOODBURY ROAD WOODBURY, NY 11797			EXAMINER GUTIERREZ, KEVIN C	
			ART UNIT	PAPER NUMBER
			2851	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/29/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/807,659	Applicant(s) GOO ET AL.	
	Examiner Kevin Gutierrez	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>5-12-05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The disclosure is objected to because of the following informalities: Page 20, line 1 - the term, "comprising" should be replaced with "includes" as suggested by the Examiner.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 7-9, 17, 20-22, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (6,052,173) in view of Yamamoto et al. (4,905,037).

Regarding claims 1 and 17, Miura et al. disclose "a light source device (fig. 1, LH1; Light source) for generating source light (col. 6, lines 57-58);

an optical fiber cord (LF1; optical fiber) for guiding the source light generated from the light source device (LH1) into a light focusing device (LO1; exposure light exit part);

a lens (fig. 7a; L1 or L2) positioned in the light focusing device (LO1) to receive the source light from the optical fiber cord (LF1), the light focusing device (LO1) to focus the source light to the edge of a wafer (W; col. 6, lines 65-67 through col. 7, line 1; figure 7); and “a wavelength corresponding to the highest absorptivity of a photoacid generator of resist coated on the wafer (col. 1, lines 42-4, where exposure light turns the resist).”

Miura et al. does not disclose “a wavelength converter for converting a wavelength of the source light.”

However, having “a wavelength converter for converting a wavelength of the source light” is known to the art as it is evident by the teaching of Yamamoto et al. (see Abstract; fig. 23, where a wavelength converter 60 is used in an image transfer system). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the apparatus of Miura et al. by including a wavelength converter for at least the purpose of transferring images to a color-imaging photosensitive medium as suggested by Yamamoto et al. (see end of Abstract).

Regarding claims 2 and 20, Miura et al. further disclose “wherein the light source device includes a lamp, a parabolic or elliptical mirror, a plate, a shutter (SH1), and a filter (col. 6, lines 54-57).”

Regarding claims 3 and 21, Miura et al. disclose as modified disclose a wavelength converter, but does not disclose "wherein the wavelength converter is made of an optically non-linear material."

However, having "wherein the wavelength converter is made of an optically non-linear material" is known to the art as it is evident by the teaching of Yamamoto et al. (col. 4; lines 8-10, where the wavelength converter is a crystal generating a second harmonic of an incident light)." Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the wavelength converter of Miura et al. by having it made of a optically non-linear material for at least the purpose of transferring colored images to a photosensitive medium.

Regarding claims 4 and 22, Miura et al. as modified disclose an optically non-linear material, but does not disclose "wherein the optically non-linear material is one selected from the group consisting of beta barium borate (β -BaB₂O₄), lithium triborate (LiB₃O₅), cesium lithium borate (CsLiB₆O₁₀), potassium titanyl phosphate (KTiOPO₄), potassium titanyl arsenate (KTiOAsO₄), potassium dihydrogen phosphate (KH₂PO₄), deuterated ammonium dihydrogen phosphate (KD₂PO₄), ammonium dihydrogen phosphate (NH₄H₂PO₄), deuterated ammonium dihydrogen phosphate (ND₄H₂PO₄), rubidium dihydrogen phosphate (RbH₂PO₄), cesium dihydrogen arsenate (CsH₂AsO₄), deuterated cesium dihydrogen arsenate (CsH₂AsO₄), lithium niobate (LiNbO₃), lithium tantalate (LiTaO₃), lithium iodate (LiIO₃), potassium niobate (KNbO₃), barium nitrate (Ba(NO₃)₂), solid-state raman shifters (KGd(WO₄)₂), potassium

Art Unit: 2851

pentaborate, 3-methyl-4-nitropyridine-1 oxide, L-arginine phosphate, and combinations thereof (col. 3, lines 2-4, where the wavelength converter can be formed of LiIO_3)."

However, having "wherein the optically non-linear material is one selected from the group consisting of beta barium borate ($\text{B-BaB}_2\text{O}_4$), lithium triborate (LiB_3O_5), cesium lithium borate ($\text{CsLiB}_6\text{O}_{10}$), potassium titanyl phosphate (KTiOPO_4), potassium titanyl arsenate (KTiOAsO_4), potassium dihydrogen phosphate (KH_2PO_4), deuterated ammonium dihydrogen phosphate (KD_2PO_4), ammonium dihydrogen phosphate ($\text{NH}_4\text{H}_2\text{PO}_4$), deuterated ammonium dihydrogen phosphate ($\text{ND}_4\text{H}_2\text{PO}_4$), rubidium dihydrogen phosphate (RbH_2PO_4), cesium dihydrogen arsenate (CsH_2AsO_4), deuterated cesium dihydrogen arsenate (CsH_2AsO_4), lithium niobate (LiNbO_3), lithium tantalate (LiTaO_3), lithium iodate (LiIO_3), potassium niobate (KNbO_3), barium nitrate ($\text{Ba}(\text{NO}_3)_2$), solid-state raman shifters ($\text{KGd}(\text{WO}_4)_2$), potassium pentaborate, 3-methyl-4-nitropyridine-1 oxide, L-arginine phosphate, and combinations thereof" is known to the art as it is evident by the teaching of Yamamoto et al. (col. 3, lines 2-4, where the wavelength converter can be formed of LiIO_3). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the non-linear material of Miura et al. as modified to have it made of at least LiO_3 or any of the aforementioned compounds for at least the purpose of transferring a colored image.

Regarding claims 7-8 and 25-26, Miura et al. further disclose (claims 7 and 25) "wherein the source light is i-line" and (claims 8 and 26) "is one of lights having a

Art Unit: 2851

wavelength within the ultraviolet range (col. 6, lines 53-54, where the light source use is in the UV range emitting UV radiation)."

Regarding claims 9 and 27, Miura et al. as modified disclose a wavelength converter, but does not disclose "wherein the wavelength converter is made of either one of potassium titanyl phosphate (KTiOPO₄) and potassium dihydrogen phosphate (KH₂PO₄)."

However, having "wherein the wavelength converter is made of either one of potassium titanyl phosphate (KTiOPO₄) and potassium dihydrogen phosphate (KH₂PO₄)" is known to the art as it is evident by the teaching of Yamamoto et al. (col. 3, lines 2-3, where the wavelength converter is made of KH₂PO₄). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the wavelength converter of Miura et al. as modified to have it made up of KH₂PO₄ or any of the other compounds aforementioned above for at least the purpose of transferring a colored image to a photosensitive medium.

5. Claims 5-6, 10-14, 18-19, 23-24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. in view of Yamamoto et al. as applied to claims 1 and 17 above, and further in view of Tanaka et al. (5,811,211).

Regarding claims 5 and 23, Miura et al. as modified disclose a resist, but does not disclose "wherein the resist is ArF resist."

However, having "wherein the resist is ArF resist" is known to the art as it is evident by the teaching of Yamamoto et al. (col. 19, lines 40-42, where the resist is

Art Unit: 2851

associated with the laser's wavelength). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the resist of Miura et al. as modified by having an ArF resist for at least the purpose of obtaining an image, since Miura et al. discloses a UV exposure source.

Regarding claims 6 and 24, Yamamoto et al. further disclose "wherein the lamp is a mercury arc lamp (col. 6, lines 50-51)."

Regarding claims 10-14 and 18-19, Miura et al. as modified disclose the claimed invention except for (claims 10 and 18-19) "wherein the wavelength converter is positioned in front of the lamp," (claim 11) "wherein the wavelength converter is positioned between the optical fiber cord and the filter," (claim 12) "wherein the wavelengths converter is positioned between the lens and the optical fiber cord," (claim 13) "wherein the wavelength converter is installed at the end of the light-focusing device," and (claims 14 and 28) "wherein the wavelength converter is attachable/removable)."

However, having the wavelength converter being attachable/removable to be placed in the specific aforementioned positions above is known to the art as it is evident by the teaching of Yamamoto et al. (see abstract, where the converter is disposed in a light path between a light source and a photosensitive medium. Further, figures 8-9, 17 and 22 correspond to similar positions for placing the wavelength converter in an image transfer system). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the apparatus of Miura et al. by having a wavelength converter attachable/removable to

Art Unit: 2851

be positioned in a manner described above for at least the purpose to transfer images to color-imaging photosensitive medium.

6. Claims 15-16 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. in view of Yamamoto et al., as applied to claims 1 and 17 above, and further in view of Minemoto et al. (5,381,429).

Miura et al. as modified disclose a wavelength converter, but does not disclose (claim 15) "wherein an anti-reflective coating film (ARC) is coated on surface of the wavelength converter" and (claim 16) "wherein the anti-reflective coating film (ARC) is made of one selected from the group consisting of zirconia (ZrO_2), magnesia (MgO), silica (SiO_2), titania (TiO_2), and combinations thereof."

However, having a wavelength converter with an anti-reflective coating consisting of one compound from above is known to the art as it is evident by the teaching of Minemoto et al. (col. 8, lines 4-9, where the anti-reflective coating of SiO_2 is applied to a wavelength converter). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the wavelength converter of Miura et al. as modified to include an anti-reflective coating and utilized in a manner described above for at least the purpose to transmit wavelengths of higher harmonics.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following disclose an edge exposure apparatus: Sato et al.

Art Unit: 2851

(US 2003/01157597), Suzuki (5,204,224), Kim (US 2002/0092964) and Gotoh (4,899,195). Kim (6,577,436) discloses and a wavelength converter).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 8:00 a.m. - 5:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin Gutierrez
Examiner
Art Unit 2851

Application/Control Number: 10/807,659
Art Unit: 2851

Page 10

December 21, 2006

A handwritten signature in black ink, appearing to read 'DL' or 'D. Lee', with a stylized, cursive flourish.

DIANE LEE
SUPERVISORY PATENT EXAMINER